

CLAIMS

1. A frequency channel assignment system comprising a plurality of radio communications systems which use a common
5 frequency band, and a controller; wherein

the controller comprises:

a system characteristics information management function configured to manage system characteristics information showing characteristics of frequency channels in the radio
10 communications systems; and

a frequency channel assignment function configured to assign the frequency channels to each of the radio communications systems, based on the system characteristics information and channel status information showing status of
15 the frequency channels, so as to avoid inter-system interference.

2. The frequency channel assignment system as set forth in claim 1, wherein:

20 the controller further comprises a required frequency channel calculation function configured to calculate the number of frequency channels required at a base station, based on at least one of call loss probability and traffic at the base station; and

25 the frequency channel assignment function is configured to assign the frequency channels to each of the radio communications systems, based on the system characteristics information, the channel status information, and the required number of frequency channels, so as to avoid inter-system

interference.

3. The frequency channel assignment system as set forth in claim 2, wherein

5 the controller comprises a control apparatus provided in each of the plurality of radio communications systems, and an inter-system common control apparatus connected to the plurality of radio communications systems;

the control apparatus comprises:

10 a function of collecting the channel status information;

a function of calculating the required number of frequency channels; and

a notification function configured to notify the required number of frequency channels and the channel status information
15 to the inter-system common control apparatus; and

the inter-system common control apparatus comprises:

a function of managing the system characteristics information;

a function of assigning the frequency channels; and

20 a frequency channel notification function configured to notify the assigned frequency channels to each of the control apparatuses.

4. The frequency channel assignment system as set forth in
25 claim 3, wherein the inter-system common control apparatus is provided in a control station in a given radio communications system of the plurality of radio communications systems.

5. The frequency channel assignment system as set forth in

one of claims 1 to 4, wherein, as the system characteristics information, at least one of overlapping use possibility on the frequency channels, priority of assigning the frequency channels, the allowable amount of interference on the frequency
5 channels, and frequency bandwidth used on the frequency channels is used.

6. The frequency channel assignment system as set forth in one of claims 1 to 5, wherein, as the channel status information,
10 at least one of use status of the frequency channels, the amount of interference on the frequency channels, and radio path change on the frequency channels is used.

7. A base station for performing radio communication with
15 mobile stations, using frequency channels in radio communications systems, comprising:

a channel status information collection function configured to collect channel status information showing status of frequency channels at the base station;

20 a system characteristics information management function configured to manage system characteristics information showing characteristics of frequency channels in the radio communications systems; and

a frequency channel selection function configured to
25 select frequency channels for use between the base station and the mobile stations, based on the system characteristics information and the channel status information.

8. The base station as set forth in claim 7, further

comprising:

a measurement function configured to measure at least one of call loss probability and traffic at the base station; and

5 a required frequency channel number calculation function configured to calculate the number of frequency channels required at the base station, based on at least one of the call loss probability and the traffic at the base station;

wherein the frequency channel selection function is configured to select frequency channels for use between the base
10 station and the mobile stations, based on the system characteristics information, the channel status information, and the required number of frequency channels.

9. A control station for controlling a plurality of base
15 stations in radio communications systems, comprising:

a channel status information collection function configured to collect channel status information showing status of frequency channels at each of the base stations; and

20 a required frequency channel number calculation function configured to calculate the numbers of frequency channels required at the base stations, based on at least one of call loss probability and traffic at the base stations,

wherein the control station is configured to select frequency channels for use between the base stations and mobile
25 stations, based on the system characteristics information, the channel status information, and the required numbers of frequency channels.

10. An inter-system common control apparatus connected to a

plurality of radio communications systems, comprising:

5 a system characteristics information management function configured to manage system characteristics information showing characteristics of frequency channels in the radio communications systems;

10 a collection function configured to collect channel status information showing status of frequency channels at base stations in the radio communications systems, and the numbers of frequency channels required at the base stations, from control stations in the radio communications systems;

15 a frequency channel assignment function configured to assign frequency channels to each of the radio communications systems, based on the managed system characteristics information, and the channel status information and the required numbers of frequency channels notified from the control stations; and

20 a frequency channel communication function configured to notify the assigned frequency channels to the control stations in the radio communications systems.

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11. The inter-system common control apparatus as set forth in claim 10, wherein, for each frequency channel available at the base stations in the radio communications systems, at least one of overlapping use possibility on the frequency channel, priority of assigning the frequency channel, the allowable amount of interference on the frequency channel, and frequency bandwidth used on the frequency channel is managed as the system characteristics information.

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12. A frequency channel assignment method for assigning frequency channels to be used for radio communication between mobile stations and base stations in a plurality of radio communications systems which use a common frequency band, the
5 method comprising:

collecting, at a controller, channel status information showing status of frequency channels at each of the base stations;

calculating, at the controller, the number of frequency
10 channels required at each of the base stations, based on the collected channel status information;

assigning, at the controller, frequency channels to each of the radio communications systems, based on system characteristics information showing characteristics of
15 frequency channels in the radio communications systems, the channel status information, and the required number of frequency channels;

notifying, at the controller, the assigned frequency channels to the base stations; and

20 performing, at the base stations, radio communication with the mobile stations, using the frequency channels notified from the controller.

13. A control method at base stations for performing radio
25 communication with mobile stations, using frequency channels, in radio communications systems, the method comprising:

collecting, at the base stations, channel status information showing status of frequency channels at the base stations;

managing, at the base stations, system characteristics information showing characteristics of frequency channels in the radio communications systems;

calculating, at the base stations, the numbers of
5 frequency channels required at the base stations, based on at least one of call loss probability and traffic at the base stations; and

selecting, at the base stations, frequency channels for use between the base stations or the other base stations and
10 the mobile stations, based on the system characteristics information, the channel status information and the required numbers of frequency channels.

14. A control method at a control station for controlling a
15 plurality of base stations in radio communications systems, the method comprising:

collecting, at the control station, channel status information showing status of frequency channels at the base stations;

20 calculating, at the control station, the numbers of frequency channels required at the base stations, based on at least one of call loss probability and traffic at the base stations; and

selecting, at the control station, frequency channels for
25 use between the base stations and mobile stations, based on the system characteristics information, the channel status information, and the required numbers of frequency channels.